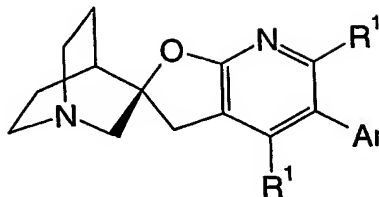- 19 -

CLAIMS

1.   A compound in accord with formula I:
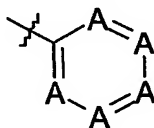

I

wherein:

Ar is a moiety formula II:

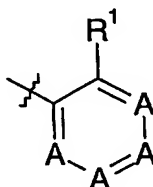II

wherein:

A is independently at each occurrence CR^1 or N provided at least one A is R^1;

R^1 is independently at each occurrence H, C_1-C_6alkyl, or halogen, provided that at least one occurrence of R^1 comprises tritium or a halogen radioisotope.

2.   A compound according to Claim1, wherein no more than one occurrence of A is N.

3.   A compound according to Claim 1, wherein no more than two occurrences of R^1 are other than hydrogen.

4.   A compound according to Claim 1, wherein Ar is a moiety of formula III.

III.

5.   A compound according to Claim 1, wherein R^1 is hydrogen or fluorine, and A is N at no more than one occurrence.
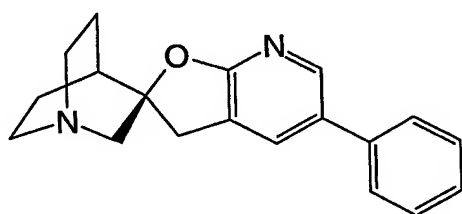
6.   A compound according to Claim 1, wherein Ar is selected from phenyl, 2-[^{18}F]fluorophenyl or 2-[^{18}F]fluoro-3-pyridyl.

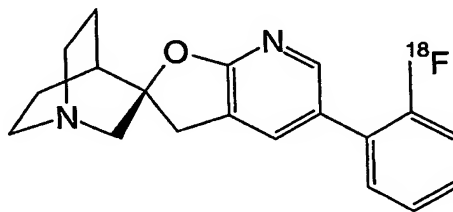5   7.   A compound according to Claim 1 comprising tritium.

8.   A compound according to Claim 1, comprising a radioisotope selected from ^{18}F, ^{123}I, ^{125}I, ^{131}I, ^{75}Br, ^{76}Br, ^{77}Br or ^{82}Br.

10   9.   A compound according to Claim 8, comprising ^{18}F.
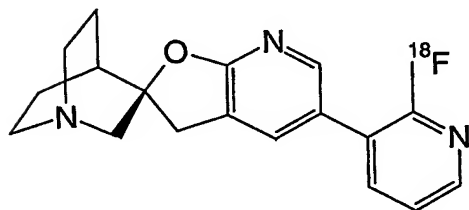
10.   A compound according to Claim 1 selected from compounds of formulae IV, V, VI, VII, VIII and IX:

15   (IV)   (V)

                     (VI)   (VII)
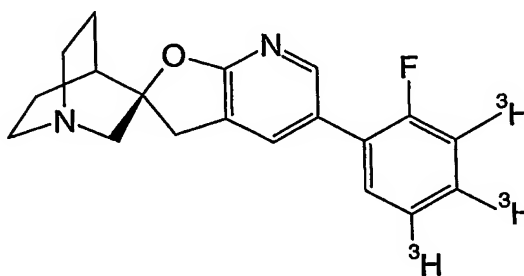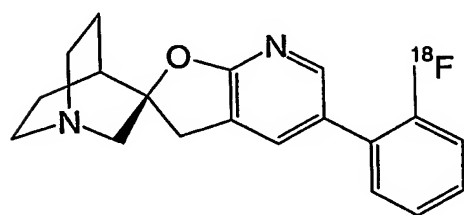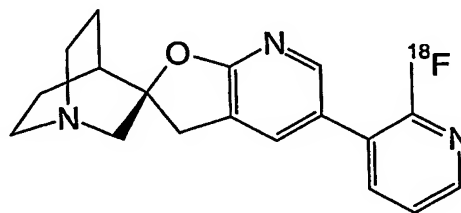

                    (VIII)   (IX)

20

11.   A diagnostic composition comprising a compound of the invention, and a pharmaceutically-acceptable diluent or carrier.

12.   A method for diagnosis of diseases or conditions in which detection of the $\alpha 7$ nicotinic receptor beneficial comprising:

administering to a subject a detectable amount of a compound of the invention;

detecting the presence and distribution of said compound in said subject;

analyzing the distribution of said compound in said subject;

using said distribution to assess the disease or condition of said subject.

13.   The method of Claim 12 for the diagnosis of psychotic disorders or intellectual impairment disorders.

14.   The method of Claim 12, for the diagnosis of Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, Attention Deficit Hyperactivity Disorder, anxiety, schizophrenia, mania, manic depression, Parkinson's disease, Huntington's disease, Tourette's syndrome, neurodegenerative disorders in which there is loss of cholinergic synapse, pain, and for ulcerative colitis.

15.   A kit comprising:

an administrable and detectable quantity of a compound according to Claim 1, and

instructions for administering and thereafter detecting the distribution of said compound in a subject.